Geothermal Project Brief

Direct-Use Geothermal Water and Space Heating

GRDA PROJECT OVERVIEW

In 1981, the California Energy Commission's Geothermal Program began extending financial and technical assistance to public entities to support the use of the energy available from the earth's heat. Funding for the Program comes from production royalty payments to the U.S. government from geothermal developers holding federal leases in California. Awards are typically issued annually to qualifying applicants in the form of grants or loans.

Many of the projects funded by the Commission during the late 1980's and early 1990's were for the construction of systems that provide space heating and hot water through the direct use of geothermal fluids. These systems serve a variety of buildings, including schools, hospitals, clinics, city offices, residences, and commercial buildings.

The fact that many of the systems are still in operation today attests to the reliability and durability of direct-use geothermal technology. Some of the systems have been expanded over the years to serve new buildings, or upgraded to include heat exchangers and temperature controls in individual rooms.

The geothermal systems funded by the Program are typically owned by the end-user, however some are owned and operated by a city or municipality. The systems have proven to yield significant savings of 50-90% of gas and electricity costs, in many cases.

Highlighted in the table on the reverse are six of the systems that were funded by the Commission during the Geothermal Program's early days.

These projects continue to produce geothermal space heating and hot water for end-users across California.

	Location	Award Years	Total Award Amount	Facilities Served	Well Depth(s)	Fluid Temp.	Flow Rate Used (gallons per minute)	Estimated Savings/Payback
Indian Springs School	Big Bend, Siskiyou County	1982, 1984, 1986	$217,085	Space and water heating for 3 classrooms, a gymnasium, the kitchen, and a 70,000 gallon swimming pool.	860 ft.	123 F	75-80 GPM (winter) 23-30 GPM (summer)	90% savings on electricity costs
Indian Valley Hospital and Clinic	Greenville, Plumas County	1981-82, 1985, 1988	$517,400	Space heating for 38,000 square foot, single-story hospital and separate clinic building.	200 ft.	118 F	80 GPM (winter only)	50% savings on electricity costs
Modoc High School	Alturas, Modoc County	1987	$585,536	Space heating for school wood shop, auto shop, art room, weight room, and gymnasium. Hot water for showers.	2940 ft.	160 F	60 GPM (average)	50% savings on gas and electricity costs; payback time 10 years
City of San Bernardino	San Bernardino County	1981-84, 1986	Grants: $281,265 Loans: $4,324,145	This system is one of the largest in the world, serving over 20 large and small buildings including City Hall, County Detention Center, San Bernardino Sun, and the Radission Hotel.	2 wells, 1000 ft. each	128 F	1500 GPM (average)	Annual customer savings between 25%-45%, compared to natural gas costs Average customer payback is 2-3 years.
Surprise Valley	Cedarville, Modoc County	1982, 1984-85, 1987-88	$516,454	Space and water heating for high school, elementary school, and hospital.	1860 ft. and 1150 ft.	128 F	40 GPM (high school) 25 GPM (elementary school and hospital)	$50,000, based on 1993 fuel data
City of Susanville	Lassen County	1981-82, 1984, 1986-88	$1,075,014	Space and water heating for about 30 residential and commercial buildings in the city of Susanville.	560 ft. and 900 ft.	156 F and 172 F	500 GPM and 300 GPM	30% savings over fuel oil; simple payback time between 9-11 years

Table: Direct-Use Geothermal Systems Funded by the Commission's GRDA Program

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